UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PUBLIC ROADS
DIVISION OF AGRICULTURAL ENGINEERING

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MONTHLY NEWS LETTER

Washington, D. C., December 20, 1929.

In wishing every one a Merry Christmas and a Happy New Year, I want also to express my appreciation of the conscientious effort that has characterized the work of all members of the staff during the past year. I feel that 1929 has been one of the most productive years of our history.

S H McCrory

Reference was made in the September NEWS LETTER to some experiments being conducted by D. L. Yarnell, in cooperation with the University of Iowa, on the flow over railway and highway embankments during floods, the purpose being to devise a formula to enable the engineer to compute the total flood flow down a valley which, of course, is made up from the discharge through bridge openings and that over the embankment. The report on this work has been completed. The experiments were made by constructing successively in the testing canal, which is 10 feet wide, sections of standard embankments, and measuring by means of a weir placed upstream from the embankment, the water flowing over the embankments under various conditions of head. In this way the embankment is considered as a broad-created weir. The specific purpose, therefore, was to determine the coefficient, C, in the formula,

$Q = C\ L\ H^{3/2}$ in which
C = the coefficient
L = the length of the embankment overflowed
H = the head corrected for the effect of the velocity of approach.

Curves showing the values of C were worked out for both single track and double track embankments under submerged conditions. For the conditions in which the water level on the down-stream side of the

embankment was lower than that on the up-stream side (that is, where there was free flow over the embankment) a formula was worked out for each type, since under those conditions it appeared that 3/2 was not exactly the correct exponent of H. The formulas thus worked out are given below, it being understood that a railroad embankment with rails removed becomes in effect a highway embankment. A full report on this work will appear in PUBLIC ROADS for February, 1930.

Single track, both rails in place

$$Q = 3.27\ L\ H^{1.47}$$

Double track, all four rails in place

$$Q = 2.95\ L\ H^{1.47}$$

Single track, upstream rail only in place

$$Q = 3.66\ L\ H^{1.37}$$

Double track, upstream track only in place

$$Q = 3.17\ L\ H^{1.48}$$

Single track, both rails removed

$$Q = 3.00\ L\ H^{1.49}$$

Double track, all four rails removed

$$Q = 2.66\ L\ H^{1.60}$$

L. T. Jessup has sent in some figures, gathered in connection with his project on Pumping for Drainage, relating to the effect of pumping on depth of water table on the Hudspeth County Conservation and Reclamation District No. 1, Texas. This project is located just below the U. S. Rio Grande Project and has a gross area of 20,300 acres. The area under cultivation in 1927 and 1928 was 12,130 and 15,600 acres respectively. A few pumps were started the latter part of June, 1926, and the number of pumps has since been increased to 45. Effect on the water table was as indicated below:

Year	Acre-feet pumped during year	Month of measurement	Per cent of total area on which depth to water was 6 feet or more
1925	- -	August	30.2
1926	8,930	June	17.4
		September	29.7
1927	19,300	January	55.2
		June	45.0
		October	63.6
1928	20,570	January	71.0
1929		January	72. (approx.)

The total cost of the system up to and including May, 1929, was $341,553. This includes about $37,000 for open drains. The cost of operation and maintenance, not including interest and depreciation, for 1927, was $47,130. For 1928 it was $50,140.

Mr. Jessup is now in the Washington office having been called here in connection with the study of certain agricultural drainage problems involved in the proposed power development on the Flathead River, Montana.

Mr. Dean W. Bloodgood has compiled data for the following tabulation of results of duty of water investigations on cotton, in Mesilla Valley, New Mexico. The field used for the investigation was of heavy clay adobe soil; slope of plots about 0.1 foot per 100 feet; length of plots varied from 200 to 400 feet; width of plots about 35 feet; Acala variety of cotton planted.

Plot No.	Amount irrigation water applied	Yield of lint cottom per acre: First picking	Second picking	Third picking	Yield of bollies per acre	Length of staple	Per cent lint	Per cent stand
	Acre-inches	Pounds	Pounds	Pounds	Pounds	Inches	Per cent	Per cent
1 to 4	16.6	618	252	36	29	1 1/8	35	92.6
5 to 8	17.1	246	345	82	94	1 1/16+	36.2	81.4
9 to 12	45.2	269	599	185	110	1 1/16+	35.9	95.8
13 to 16	19.8	428	446	122	70	1 1/16	36.7	91.3
17 to 20	19.5	538	435	140	50	1 1/16	36.4	84.0
21 to 24	14.0	452	287	66	52	1 1/16	36.8	90.6

A different irrigation treatment was applied to each group of plots. These did not have any noticeable effect on the shedding of squares and bolls.

W. W. McLaughlin returned the latter part of November from an extended trip through the southwestern States. On December 8 he went to Reno, Nevada, to attend a conference of State Engineers of the Western States.

Fred C. Scobey addressed the Student Chapter of the A.S.C.E. of Stanford University December 4, on the subject "Water Conduits You Will Encounter in Civil Engineering Practice."

A. T. Mitchelson left Berkeley November 23 for a three weeks trip through southern California, Arizona, Texas, and New Mexico, gathering data for his project on canal linings.

M. A. R. Kelley's report of the recent survey of dairy barns in southeastern Pennsylvania is being published serially in the Milk Producers' Review of Philadelphia under the title "Suggestions for Improvements of Dairy Barns in the Southeastern Section of Pennsylvania."

S. J. Dennis returned to Washington in November from Toledo, Ohio where he was engaged in work on stubble burners and steam sterilizers in connection with the corn borer control project. Later he made a trip to Pittsfield, Mass. for the Plant Quarantine Division to obtain data for specifications on some new spraying equipment for Gypsy moth control.

T. A. H. Miller has prepared a classified list of farm building plans drawn at the State agricultural colleges which will be distributed among the divisions of agricultural engineering of the various State institutions.

George R. Boyd during December visited N. A. Kessler at St. Paul, Minnesota, for the purpose of going over with Mr. Kessler the data he has secured in connection with the land-clearing project being conducted in cooperation with the University of Minnesota, and planning the work to be carried on during the next calendar year.

W. R. Humphries, who has been in the field several months, first, in connection with combine studies in North Dakota, and later on the farm power survey, has returned to Washington. The farm power survey is a study being conducted in cooperation with certain departmental bureaus and State agricultural experiment stations.

The regular annual meeting of the Structures and Machinery Divisions, A.S.A.E., was held at Chicago December 2-5. These meetings were attended by Mr. McCrory, and by Messrs. Gray and Betts.

B. S. Clayton has completed a brief survey of some land in southern Louisiana that is being considered for use in connection with extensive studies in the drainage of sugar-cane land. The drainage phase is but one of the several involved in a comprehensive program of research by the Department, planned to aid the sugar-cane growing industry in the South.

A. H. Sonner has prepared plans for a medium pressure steam heating layout for a greenhouse for Foreign Plant Introduction at Beltsville, Md.

W. M. Hurst is preparing reports giving the results of tests made during the past summer on grain drying in North Dakota and rice drying in Arkansas. This work is in cooperation with the Division of Grain Investigations of the Bureau of Agricultural Economics.

The agricultural appropriation bill as reported to the House contains a total of $394,500 for our Division. A special item of $2,500 for the investigation of sugar-cane drainage was added to the bill by the Appropriations Committee of the House. This is an apparent increase of $107,500 over the appropriation for 1930, but $75,000 covers corn borer work which heretofore has been carried under a separate fund. The item for erosion studies in 1931 carries an increase of $25,000 making the total, $185,000 to be expended by the three bureaus charged with this work.

The following bulletins have been issued in the last two months or will be available soon:

Farm Drainage, by L. A. Jones. Farmers' Bul. 1606
Flow of Water in Riveted Steel and Analogous Pipes, by F. C. Scobey. Technical Bul. 150
Corn Stalk Shaver - Sled Type, by Frank Irons. Misc. Pub. 69